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FIVE-YEAR REVIEW REPORT

Osborne Landfill Superfund Site

Pine Township, Mercer County Pennsylvania

Prepared by:

U.S. Environmental Protection Agency

Region III

Philadelphia, Pennsylvania



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7/28/00

Date

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**U.S. Environmental Protection Agency
Region III
Hazardous Site Cleanup Division
Five-Year Review
Osborne Landfill Superfund Site
Pine Township, Mercer County, Pennsylvania**

I. Introduction

EPA Region III conducted this review pursuant to CERCLA Section 121(c), N.C.P. Section 300.400(f)(4)(ii), and OSWER Directives 9355.7-02 (May 23, 1991), and 9355.7-02A (July 26, 1994). It is a statutory review. The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. This document will become a part of the Site file.

II. Background

The Osborne Landfill Site is located in Pine Township, Mercer County, Pennsylvania. Located less than one mile east of Grove City, Pennsylvania, the Site encompasses approximately 15 acres along the East Pine Street extension. To the north of the Site are woodlands. Farmland is present to the east and southeast across the East Pine Street Extension. A large shallow pond is located just west of the Site and considered to be a federally protected wetland. Another wetland is situated south of the Site on both sides of the East Pine Street Extension. The immediate Site area is sparsely populated. Most of the residential homes near the Site, are located along Enterprise Road, which is approximately 1/4 mile north of the Site, or are located to the east along Diamond Road. Homes along Enterprise Avenue and Diamond Road previously used ground water, until Cooper Cameron, a Potentially Responsible Party (PRP), extended the municipal water line around the eastern perimeter of the Site. Cooper Cameron connected any resident, within one hundred and fifty feet of the water line, who was willing to accept the connection. Only one resident refused the connection to public water and this well has been periodically sampled and Site contaminants have not been detected.

Strip mining was conducted at the Site during the 1940s, prior to disposal of wastes in the strip mine pit. Fill material was deposited into the strip pool at the base of the highwall from the late 1950s to 1978, when the Site was closed by the Pennsylvania Department of Environmental Protection (PADEP) for not having a permit to accept wastes. A wide array of wastes were disposed which contained metals, volatile organic hydrocarbons, semi-volatiles and polychlorinated biphenyls (PCB)s. The primary waste by volume was foundry sand from Cooper Industries (Currently Cooper Cameron).

Several Remedial Investigations have been conducted at the Site. The investigations have focused on the fill area, the wetlands to the southwest of the Site, the Clarion Aquifer/Mine Void system, the Homewood Aquifer System and the deeper Connoquenessing and Burgoon Aquifers.

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These investigations documented contamination in the fill above EPA's action levels. These investigations also documented contamination of ground water in the Clarion Formation with vinyl chloride above Maximum Contaminant Levels ("MCLs") allowed by the EPA's Safe Drinking Water Act. The wetlands to the southwest did not contain contaminants at levels of concern.

The first Record of Decision (ROD#1) which was issued in September of 1990 selected installation of a slurry wall around the perimeter of the Site, and a clay cap to prevent infiltration of rain into the fill. To prevent leachate from leaving the fill, extraction wells were installed in the fill to remove leachate and to produce an inward hydraulic containment. This is measured by six well nests which measure the pressure in the fill, the Clarion Formation and the Homewood Formation. The collected leachate is treated by an iron and manganese removal system, air stripping and carbon adsorption. The treated leachate is injected into the mine pool to the east of the Site. This was done to prevent any potential for subsidence of nearby homes due to ground water extraction.

ROD#1 also selected pump and treatment as the remedy for contaminated ground water in the Clarion Aquifer. A fence restricts access to the Site and additional warning signs near the entrance gate are posted. Post-closure use of the property, which is owned by a PRP who is the respondent to a Unilateral Order, will be restricted to protect the cap and associated systems indefinitely. The PRP has placed a deed restriction on the property which satisfies this requirement.

During the design of the remedies selected in ROD#1, pump tests showed that it was not possible to remediate the Clarion Aquifer as described in ROD#1. Aquifer response tests performed during the Remedial Design indicated that reasonable ground water capture zones could not be created by extraction wells placed in the Clarion Aquifer. Instead, very narrow columns of water would be drawn from the more contaminated mine pool into the Clarion sandstone aquifer. At that time, EPA was also conducting an investigation of the deeper aquifers at the Site, which are in communication with the shallow aquifer. Therefore, EPA decided to wait until the investigations were completed, so that an integrated ROD for all Site ground water could be issued. The second ROD (ROD#2) issued on December 30, 1997 addressed all Site ground water and the wetlands to the southwest of the Site. The wetlands had not been impacted by Site contaminants and EPA selected "No Action" for the southwest wetlands. EPA selected "Natural Attenuation with Monitoring" for the contaminated Clarion aquifer and three years of ground water monitoring for the deeper uncontaminated aquifers at the Site.

Site construction began on August 5, 1995, and all construction at the Site has been completed. A Preliminary Close Out Report (POOR) was signed in September 1998 and Site was declared "Construction Complete". The leachate treatment system has operated since January 1996 and has drawn the water level down inside the slurry wall containment producing an inward pressure gradient for the Clarion Aquifer, as measured by the performance wells.

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III. Site Chronology

The Osborne Landfill operated from the 1950s through 1978 when the Site was closed by the Pennsylvania Department of Environmental Resources (Previously the Pennsylvania Department of Environmental Resources). EPA began assessing conditions at the Osborne Landfill Site ("Site") in the early 1980s. The Site was proposed for the National Priorities List (NPL) in 1982 and formally placed on the list in September 1983. Cooper Industries, a potentially responsible party, built a security fence around the Site and posted it with warnings to prevent unauthorized access in 1983. Cooper Industries also removed and disposed of 83 filled drums, 460 empty drums, and 45 cubic yards of contaminated soil. In 1994, Cooper Cameron (previously Cooper Industries) extended a public water line on the east side of the Site in reaction to high levels of contamination found in a resident's well. This extension virtually completed a loop which now supplies residents potentially at risk, near the perimeter of the Site, with municipal water.

Under a Consent Order with Pennsylvania, Cooper Industries conducted a Remedial Investigation of the Site, but was unwilling to comply with all of the conditions required by the State and EPA. In 1988, at the request of the State, the EPA took over the investigation and completed an intensive study of Site conditions and produced the Remedial Investigation (RI), Feasibility Study (FS) and Risk Assessment (RA) reports. On September 28, 1990, the EPA chose a remedy (Record of Decision or "ROD") for the fill material, the on-Site water table, and the shallow aquifer. After long negotiations, EPA was unable to obtain an agreement with the Responsible Parties. EPA issued a Unilateral Administrative Order (UA) to Cooper Industries in March 1991 to install a slurry wall, clay cap, and leachate treatment system for the fill area. The UA also required the installation of a pump and treat system to reduce low levels of vinyl chloride to the Maximum Contaminant Levels (MALS) or non-zero Maximum Contaminant Level Goals (MCLGs) set by EPA for drinking water. General Electric, who sent wastes to the Site, contributed a cash settlement to reimburse EPA for past costs. A slurry wall has been constructed around the perimeter of the fill area to a depth of forty feet, and a low permeability cap has been installed over the fill to reduce infiltration of rain and the leaching of contaminants. In addition, leachate is being extracted from the fill area, treated, and re-injected into the on-Site mine pool. The construction of the remedy for the fill area was completed during the summer of 1997. The leachate treatment system has operated for several years.

Earlier studies indicated that the deep groundwater under the Site was flowing towards the Grove City municipal wells. Under a Consent Order with EPA, Cooper Industries installed a line of deep wells between the Site and the Grove City wells to protect the water supplies. These wells have not shown Site related contamination to date. Under the Consent Order, Cooper Industries also conducted additional studies of an adjacent wetlands area and completed a supplemental RI/FS for groundwater. A ROD for groundwater and the adjacent wetlands was signed on December 30, 1997. The ROD selected No Action for the wetlands, and Natural Attenuation with monitoring for groundwater, changing the remedy from pump and treatment to Natural Attenuation. Two Explanation of Significant Differences (ESDs) documents were later issued for the Site. The first ESD modified the way that the inward hydraulic gradient is measured, and

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modified some institutional controls for the Site. A second ESD changed some of the well locations that would be used to monitor ground water contamination. The Site is considered "Construction Complete", but leachate treatment will continue for at least several more years, and groundwater monitoring for natural attenuation will continue for at least seven years. The monitoring around the perimeter of the landfill to verify that the containment remains protective will continue indefinitely.

IV. Remedial Actions

The following sections will focus on the completed portions and modifications to the remedy at the Site and will discuss the effectiveness of the various cleanup actions.

ROD#1 - Fill Area

A slurry wall was installed around the perimeter of the fill area to a depth of approximately 40 feet and was keyed into the clay layer beneath the Site. A multilayered cap was installed over the slurry wall to reduce infiltration. Storm water channels around the perimeter of the cap collect runoff and carry it around the cap system. The runoff from the storm water channels is discharged through two culverts to a nearby stream. After some initial problems, the cap has been heavily vegetated. Extraction wells in the fill lower the water table to produce an inward gradient so that leakage would be inward and this also produces an inherent pump and treatment remedy, since the extraction wells remove about ten to twenty gallons per minute of contaminated ground water (leachate). This water comes from the surrounding aquifers which supply this leakage.

The gradient between the fill and the Clarion Aquifer is adequate along the wall. The lowered water level in the containment has generally produced an inward gradient between the Homewood Aquifer and the fill, however two wells have not responded as expected. The performance wells H3 and H4 indicate that there is not an inward gradient at the southern end of the Site along the Pine Street extension. There were several possibilities that could have produced this problem: 1) Remedial Design studies indicated that the clay confining layer was missing at the southern end of the Site. The strip mine pit did not extend to the southern end of the Site, and the extraction well farthest to the south is in natural geological materials of much lower permeability. This lack of clay could reduce the pressure gradient due to pumping. 2) A limited section of the slurry wall near the Pine Street extension was produced in two phases. The slurry wall was constructed to the required depth, and the area above the slurry wall was backfilled and compacted to the final elevation. The shallow section of the slurry wall was then constructed and keyed into the deeper segment. If this were not done properly, water could flow into the containment through "windows" in the slurry wall reducing the gradient across the wall. 3) The yield from the extraction wells at the southern end of the Site are relatively low. During construction, EPA and Cooper Cameron realized that additional extraction wells in this area might be needed and ran additional piping in case more wells were necessary.

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EPA required Cooper Industries to analyze the available information and to try to determine the cause for the lower gradient along this section of the slurry wall. This analysis was included in a report titled: "Performance of OUI Remedial Action, Osborne Landfill, March 17, 1998". The report showed that the problem is not primarily related to leakage into the containment. The water levels in the fill have dropped, but the pressure in the Homewood Aquifer has dropped faster. When Cooper industries shut down one of the extraction wells at the Site (EX-8), within one and one half hours, the Homewood Aquifer water level recovered more than three feet. The report from Cooper Industries suggests that these extraction wells are preferentially drawing water from the Homewood Aquifer rather than the "fill" due to the lack of the clay layer in this area. EPA determined that the inward gradient was sufficient to satisfy the performance standard in the Record of Decision.

Since that time, there has been some overall decline in well yields possibly due to iron bacteria, and well maintenance was conducted on one well to restore its previous yield. The well yield actually dropped initially and then recovered to the same level observed before treatment. On July 12, 2000, EPA met with Cooper Industries to review all of the recent ground water data, including extraction well yields, performance well levels and concentrations and trends over the past several years. It appears that the decline in well yields may be due to a steady decline in the adjacent aquifers, which is documented by computer logs of the pressure levels in both the Homewood and Clarion Aquifers. The hydraulic gradients are still very similar now as those observed in previous years. The inward gradient is still sufficient to be protective. Iron in this area is high and periodic well maintenance and treatment may be needed in the future. Additional data is included in the attached memo to the file dated 7/13/2000.

There are six performance well nests installed at even intervals along the perimeter of the slurry wall. At each nest, one well is installed in the fill, another installed in the vertically adjacent aquifer, and a third installed below the clay layer in the Homewood aquifer. These nests monitor water levels, and are sampled periodically for contaminants of concern. After several years of data, it appears that the containment is working as expected and that there have been no major releases of contamination through the slurry wall. One interesting result seen both in the leachate in the fill, and in the wells adjacent to the wall is that vinyl chloride has shown a slight increase. Although the leachate extraction wells were not included in the remedy as a pump and treat system for the contaminated Clarion Formation adjacent to the fill, they are functioning as a minor pump and treatment system. As water is extracted from the containment, water from the Clarion Formation leaks into the containment and the extraction wells, in effect, act as a minor pump and treat supplement to the Natural Attenuation remedy selected for the Clarion Formation. As explained in the attached memo dated 7/13/00, Cooper Industries will attempt to re-focus the extraction well rates to achieve a faster cleanup of the vinyl chloride in the containment and to reduce concentrations in one of the performance well nests.

Water from the extraction wells is treated by iron/manganese removal, air stripping and polished by carbon adsorption. At this time the only significant contamination in the leachate is vinyl chloride and dichloroethenes. The treated water is transported to injection wells to the east

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of the Site, at a location generally to the east of the contaminant plume in the Clarion Formation. This provides a small hydraulic "barrier" between the residents to the east and the vinyl chloride plume. EPA avoided placing the extraction wells close to the fill area, which might have "pushed" contaminated water towards the residents.

EPA believes that this containment system is meeting the Remedial Action Objectives (RAOs). An added protection is the presence of a water line, which was extended around the eastern perimeter of the Site to provide the residents closest to the Site with municipal water. The residence closest to the Site contained the only contaminated residential well discovered at the Site. This water line gave the resident public water and provided protection to other residents further from the Site.

ROD#2

ROD#2 was issued in December of 1997 and revised the ground water remedy for the Clarion Aquifer from pump and treatment to Natural Attenuation. A description of the Site geology is necessary to understand EPA's decision to revise the selected remedy. The top layer to the east of the Site is about ten to twenty feet of overburden over twenty to thirty feet of sandstone. The sandstone is considered the Clarion Aquifer. Underlying the Clarion sandstone was a layer of coal, known as the Brookville coal seam. The coal seam angled downward to the east and the coal seam was deep mined using the "room and pillar technique". To the east of the fill area are a network of open mine voids full of ground water forming a mine pool. Based on numerous monitoring wells, the vinyl chloride contamination was relatively high in the mine voids (one well was 47 ppb), but only trace levels of vinyl chloride were present in the Clarion Aquifer. The only exception to this was the one residential well in the Clarion aquifer which did contain 10 - 15 ppb of vinyl chloride. Underneath the Clarion Formation is a clay layer and then the sandstone Homewood aquifer. With the exception of one well directly adjacent to the slurry wall, vinyl chloride has not been detected in the Homewood Aquifer.

During the design phase, it became apparent that due to mine subsidence, the Clarion Aquifer was fractured and that a well placed in the Clarion Formation would preferentially draw mine void water upward in a column through the thin Clarion sandstone layer. Each well would have a tiny lateral capture zone and numerous wells would be needed. An extraction well would also draw contaminated mine water into the Clarion Formation which is used as a drinking water aquifer in the vicinity. The other option would be to attempt to pump and treat a very large volume of mine water to remove relatively small levels of contaminants. An additional consideration was the steady decline in vinyl chloride levels in the mine voids. EPA was concerned that by the time the ROD was issued, negotiations completed, the design approved and the pump and treat system constructed, there might not be contamination left above MCLs. EPA changed the remedy, for the Clarion Formation, to Natural Attenuation in December 1997.

The deeper aquifers were of special concern because the municipal wells were within two

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miles to the northeast of the Site. In the 1997 ROD, EPA required the placement of some additional deep well nests in both the Connoquenessing Aquifer and the even deeper Burgoon Aquifer between the municipal well location and the Site. These well nests did not show contamination. Cooper Industries will continue to monitor them for three years, but if no contamination is detected, they will be abandoned.

Recent analytical results from the Natural Attenuation ground water monitoring support the continued decline in vinyl chloride levels over a wide area of the plume. Contamination is approaching MCLs over much of the area. The one exception is a small area around the one contaminated residential well which continues to show about 5 ppb of vinyl chloride. It appears that this area will be the last section to attenuate to MCLs. The municipal water line is available in this area and no residents are at risk. EPA considers the ground water remedy to be protective at this time, but will continue to monitor the ground water concentrations until MCLs are met and afterwards for five years.

Additional residential wells around the Site were sampled this year on a one time basis to give nearby residents greater confidence that our remedy is fully protective. After this major sampling event, a more targeted periodic residential sampling will occur. None of the additional wells sampled contained Site related contaminants.

The PRP performing the Site work, Cooper Cameron, purchased the landfill property so that the property would be under their control. They will enforce the institutional controls, and are a respondent to a Unilateral Administrative Order from EPA, so that they must comply with the institutional control requirements. Cooper Cameron has placed a deed restriction on the property. General Electric was also a PRP, but this corporation chose to enter a cash settlement with EPA to pay for its obligations.

Throughout the cleanup, a site-specific, action-specific, Health and Safety Plan and Contingency Plan were developed and properly implemented for each of the field activities and remedial actions. Each plan was regularly reviewed and updated as appropriate throughout the cleanup. All workers at the Site are required to be briefed on hazards and precautions, and must read the relevant portions of the Site Health and Safety Plan (HASP). All workers must have Safety Training and comply with all OSHA standards and the HASP. All visitors must be accompanied by a qualified representative of Cooper Cameron or their contractor.

V. Five Year Review Findings

EPA and PADEP visit the Site periodically to oversee the remedial action and related activities. Concerns raised during oversight have been routinely addressed by Cooper Cameron. This five year review is partially based on these visits. In early 1998, Mr. Robert Kimball visited the Site several times and reported erosion problems which were subsequently corrected. EPA and Mr. Robert Kimball of the PADEP visited the Site for a construction completion inspection on March

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9, 1998. The last inspection was conducted on July 11, 2000 during which the Site was inspected and recent data reviewed with Cooper Cameron and their contractor (CEC). The PADEP was invited to the inspection, but was unable to attend because of conflicting commitments. The PADEP has been sent a copy of the memo to the file documenting both the inspection and the data/performance standard review.

VI. Assessment

Cooper Cameron has completed the remedial actions to date in accordance with the remedial designs, Records of Decision, and their modifications.

VII. Deficiencies

Extraction well maintenance is needed, but the remedy is still protective even at current extraction rates.

VIII. Recommendations and Required Actions

Continuing attention to extraction well maintenance and operation will be necessary to assure that the remedy remains protective. Additionally, oversight of the monitoring activities will be necessary to assure that the contamination continues to decline to MCLs throughout the plume. EPA and the PADEP will insure that appropriate maintenance is performed.

IX. Protectiveness Statement

The remedies selected in ROD#1 (Fill Area) are protective of human health and the environment. The immediate threats have been addressed as described above and all remedial actions have been performed in accordance with the design and the remedy decision documents.

The Natural Attenuation remedy (ROD#2) will not be fully protective until MCLs are met. EPA expects this to occur within five years.

X. Next Five-Year Review

The next five-year review will be conducted by August 5, 2005.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Your Copy

SUBJECT: Osborne Landfill Superfund Site
Five Year Review Inspection and Site Review

DATE: 7/13/2000

FROM: Frank Vavra, RPM *FV*
Western PA Section

TO: Site File

On 7/11/00 I met with Dick Weinzierl (Cooper Cameron), Ken Miller (Civil and Environmental Consultants, CEC's geologist and the Treatment Plant Operator to inspect the Osborne Landfill Site.

Site Inspection 11:00 - 1:00

The day was sunny and visibility was very good. A dense grass cover has been established on the cap of the landfill which now resembles a golf course green. The rip-rapped slopes leading down to the drainage channels around the perimeter of the cap were heavily vegetated with grass and wild flowers. The drainage channels now support heavy wetlands vegetation including cattail reeds, small willow saplings and other wetlands plants along most of the perimeter of the site. The artificial wetlands which was constructed along the western side of the cap is thriving. All of the rest of the property inside the fence line is either covered with grass or fields of wild flowers. No odors from the landfill were detected. The water treatment plant building is well maintained and the overall aesthetic impression is that the site seems more like a very well maintained park than a landfill.

The group walked along the maintenance road around the perimeter of the landfill. There was some soil wash down onto the maintenance road followed by revegetation. The maintenance road is not as distinct as the last time when the entire road was gravel, but the layer of soil and grass along the inside half of the road would not preclude adequate access and no action is needed to restore the road at this time. Extraction wells, vaults and rip-rapped drainage channels which conduct water off the cap to the main drainage channels were in good condition. The erosion which was noted at the last visit has stopped and virtually no evidence of erosion was present anywhere along the cap. There was some very minor evidence of settling, but no areas appeared to need corrective action. The cap settlement has just been checked by surveying the settlement monuments and no significant problems have been found. Cooper Cameron will send the results on settlement to EPA shortly. Prior to the remedial action, fence integrity was a problem. Fence integrity was excellent all along the perimeter of the property, probably because of the increased visibility and the presence of the treatment plant operator who also mows the grass at the site. Signs warning of danger are present at short intervals along the fence. The main sign at the front gate identifies the site as the Osborne Construction Site and contains warning language, but does not identify the Site as a Superfund Site. Cooper Cameron has agreed to add a sign to the front gate, identifying the site as the Osborne Landfill Superfund Site shortly.

The culverts which carry surface water runoff from the drainage ways and the cap were inspected. Several oversized culverts were used in anticipation that sediment would partially fill the culverts. They are functioning properly and a fan of sediment which smothered wetlands vegetation near the culvert has been totally revegetated with cattails and other wetlands vegetation. There was no evidence of cracking or other problems in the road over the culverts.

The water treatment plant building and equipment has been well maintained. Some puddles of condensation from the treatment plant vessels were noted, but no leaks were observed. The treatment plant building has double containment and no cracks were noted in the floor of the building. Supplies and equipment were stored in an orderly fashion. Required documentation was present including O&M manuals, Health and Safety Manuals and equipment documentation were present. An excellent computer system both controls operations and stores collected data to display past performance of the main treatment plant variables, as well as water levels in the performance well nests and the pumping rates and levels in the extraction wells. All systems were operational and functioning. The overall inward hydraulic gradient is acceptable and is within performance standards. There are some minor problems in the operations of the extraction wells which will be discussed in more detail later.

No new development was noted in the area around the landfill property, or in the immediate area. The land to the east of the site and adjacent to the Site fence is still used as a cornfield raising the potential for elevated metals in the performance wells to the east of the cap due to fertilizer usage. To the west of the site is a very productive natural wetlands, which has been extended by the created wetlands corridor which links to a large pond and wetlands to the northwest of the Site. To the south of the site is a cornfield, and to the north are homes with a woodlands buffer.

Meeting at Cooper Cameron Office 1:00 to 3:30 pm

Cooper Cameron has shut down virtually all activities and its office building was almost empty and movers were taking furniture out of the office building during the meeting. My concerns about management continuity were answered by Dick Weinziel, who explained that while operations are shutting down, he expects to continue managing Site operations in the near future from Grove City. Cooper Cameron is still financially viable, but the need for the specialized equipment from the Grove City Plant has declined.

Cooper Cameron supplied me with the graphs of water levels in the performance wells over the past three years, so that I could assess in detail whether the inward hydraulic gradient is being maintained. My concern was raised by a decline in the productivity of the extraction wells. The overall ground water extraction rate has declined from about 27 gallons per minute at startup to about 12 gpm currently. It was expected at startup that the overall rate decrease until the site reached equilibrium. However, the continued decline over the last years concerned me and I thought the inward gradient might also be decreasing. The data shows that the net inward gradient is about the same as several years ago, however water levels both inside the containment and outside the containment have shown a slow decline over time and has lowered the productivity of the wells. Cooper Industries tried rehabilitating one well using the procedure supplied by the expert on extraction wells at the USACE center of expertise in Omaha, Nebraska. The rehabilitated well lost almost all of its yield after treatment, but after several days the yield climbed back to the level before treatment. Cooper Cameron

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was reluctant to rehabilitate additional wells using this procedure.

Cooper Cameron also supplied me with updated sampling information on the monitoring wells in the Clarion Aquifer, the Homewood Aquifer, the performance wells around the landfill perimeter and residential well samples. Tables of the contaminant concentrations in each of the extraction wells and the net leachate concentrations were included. Cooper Industries showed that the net leachate contaminant concentrations are close to performance standards and Cooper Cameron would like to know when they can shut down the treatment plant. They would like to understand the criteria that EPA will use to make that decision since the ROD does not specify the method of calculation. Except for the Eickman well, residential well samples did not contain site related contamination. Monitoring wells in the cornfield show a continued decline in vinyl chloride, however the Eickman well is still contaminated and several other wells still show low levels of contamination. One unexpected sampling result was vinyl chloride contamination in the Clarion and Homewood aquifer wells at location C2. H2 which originally did not contain contamination. C2 contained 5 ppb and H2 contained 17 ppb of vinyl chloride. Additionally, the extraction wells inside the containment near this well nest also show very high levels of vinyl chloride. I left the meeting to review the information back at the hotel.

Meeting with Cooper Cameron 7/12 8:30 - 11:00

At this meeting, I noted that there were relatively high levels of lab contaminants shown in about five of the residential well sample. Two results showed high levels of acetone which are almost certainly due to lab contamination, since acetone bio-degrades so easily that it is almost never found as a ground water contaminant. Two wells showed relatively high levels of methyl chloride. Past samples from these wells did not show this compound, and it is also a suspected lab contaminant. Although vinyl chloride is the only contaminant which has migrated from the site, I was concerned that these results might upset the residents unnecessarily. Although all of the residential wells which contained the lab-related contaminants are connected to the municipal water line, Cooper Cameron will contact the laboratory to have them review the data. Cooper Cameron will ask the lab to give us their opinion as to whether these compounds are likely due to lab contaminants. Cooper Cameron will also review the data for the lab blanks, and verify that these homes are still using the municipal water line.

We then revisited Cooper Cameron's desire to shut down the treatment plant. I explained that a substantial portion on the fill contains leachate above the shutdown criteria. The individual extraction wells showed the following results:

- X2 - vinyl chloride (VC) above the MCL
- X4 - VC above the PQL performance standard
- X5 - TCE is 8 times the MCL, and VC is 2 times the MCL
- X6 - VC is 15 times the MCL
- X8 - VC now below PQL, but was above PQL one year ago

- X1, X3, X7 and X9 are below the PQL

In summary, more than half the extraction wells show levels above shutdown performance standards, and X5 and X6 have very high contaminant concentrations.

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Although Cooper Cameron showed that the net concentration of influent to the plant was very low in contaminants, this is primarily due to the fact that X7 and X8 supply over three quarters of the leachate collected. This dilutes the net influent even though much of the landfill which has lower permeabilities still is contaminated. The well nest outside the area which contains X5 and X6 also shows vinyl chloride contamination. Several monitoring wells in the cornfield also show low levels of vinyl chloride, and the Eickman persistently shows vinyl chloride contamination.

Considering the high levels of contamination in X5 and X6, and the continued presence of vinyl chloride in some monitoring wells, EPA informed Cooper Cameron that a shutdown of the treatment plant would be premature at this time. Not every extraction well needs to meet the shutdown criteria, but EPA must be convinced that most of the fill is close to these levels. If Cooper Industries can reduce the high concentrations inside the containment near X5 and X6, and show a continued decline in the wells in the cornfield including C2 and H2, EPA might contemplate a shutdown of the treatment system or perhaps intermittent operation. Cooper stated that the company has been budgeting almost \$250,000 each year for Osborne and that they wish to accelerate the remediation. Cooper Industries proposed reducing the flow from the less contaminated wells to try to flush more water through the contaminated area. EPA may need to relax the inward gradient requirement during this effort. Cooper also asked EPA if they could analyze for metals and PCBs on a less frequent basis since levels have been within MCLs for several years. Cooper Cameron will submit a proposal to EPA shortly to accelerate the cleanup of the area around extraction wells X5 and X6.

Cooper Cameron also expressed some concern that the Eickman well might remain contaminated after all other wells have met performance standards. Cooper Cameron asked EPA whether this would affect the shutdown. EPA explained that we would need to look at the entire ground water picture at that time, but contamination in the Eickman well might not preclude a shutdown of the leachate treatment plant.

Action Items

- Send Cooper Cameron the website address for the extraction and injection well guidance document produced by the USACE.
- Brief PADEP on the results of the inspection and meetings.
- Brief Site hydrogeologist on inspection and meeting.
- Evaluate Cooper Cameron proposal to speed up fill cleanup and for reduced monitoring frequency for some analytical parameters.

Conclusion

- Although there are some system operations that can be improved and a new sign at the gate is needed, the remedy remains protective.

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cc. Gregg Crystall
Christine Dougherty
Mindi Snoparsky
Tom Cinti

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